

STAPELIEAE (ASCLEPIADACEAE) FROM SOUTH TROPICAL AFRICA: 8

L. C. LEACH

ABSTRACT

A new species of *Trichocaulon* N. E. Br. from Angola is described as well as a new variety of *Huernia verekeri* Stent from the western escarpment of the Serra de Chela in Angola. The distribution of this latter species, as now known, extends from the shores of the Indian Ocean almost to the Atlantic coast of Angola. The generic distinctions between *Duvalia* and *Huernia* are discussed and further, more detailed evidence is presented in support of three recent transfers from *Duvalia* to *Huernia*.

UITTREKSEL

STAPELIEAE (ASCLEPIADACEAE) VAN SUIDELIKE TROPIESE AFRIKA

'n Nuwe *Trichocaulon* N. E. Br. soort vanaf Angola en 'n nuwe *Huernia verekeri* Stent vanaf die westelike plato-rand van die Serra da Chela in Angola word beskryf. Die verspreiding van laasgenoemde soort, soos tans bekend, strek van die Indiese Oseaan kus tot byna aan die Atlantiese kus van Angola. Die verskille tussen die geslagte *Duvalia* en *Huernia* word bespreek en meer bewyse word aangebied ter staving van drie nuwe oorplasinge van *Duvalia* na *Huernia*.

Trichocaulon mossamedense Leach, sp. nov.

T. pedicellato Schinz arcte affinis sed planta grandissima, robustissima, caulibusque crassioribus spinosioribus; pedicellis longioribus; corolla minus profunde lobata, tubo 2-plo longiore; corona profundius cupuliformi, lobis exterioribus emarginatis (vix bifidis), lobis interioribus antherisque in cupula coronae paene inclusis, essentialiter differt.

Planta succulenta spinosa, erecta, usque 30 cm alta, caulibus 1-4, plerumque c. 20 cm longis, 4-5 cm diam., prominenter 16-20 angulatis; angulis compressis tuberculatis; tuberculis conicis compressis, 4-7 mm altis, secus angulos confluentibus, omnibus spina valida, brunnea, usque 6 mm longa munitis. *Flores* tuberculi apice deinceps prodientes, plerumque caulis apicem versus; pedicellorum reliquiis persistentibus pedunculum brevem crassum, nodosum, more *Huerniae urceolatae* Leach, gradatim formantibus. *Bractee* glabrae, anguste deltatae, c. 1 mm longae. *Pedicelli* glabri, 10-15 (18) mm longi, c. 1 mm diam. *Sepala* deltata, acuminata, subtus obtusa, 2,5-3,0 mm longa, c. 1 mm lata basibus paululum imbricatis, dentibus carnosius parvis interdum intus sepalis alternantibus. *Corolla* rotata, c. (9) 12 mm (*Mendes* 3845, 19 mm) inter apices loborum alternorum, marronina, saepe intense atro-marronina extus glabra, intus minutissime papillosa, pilis brevissimis, plerumque acutis, sub-appressis, vestita; *tubo* c. 1,5 mm longo; *corollae lobis* ovatis, acuminatis, c. 4 mm longis,

Accepted for publication 1st May, 1973.

basi 3,5 mm latis, plerumque leviter convexus. *Corona* glabra, atro-marronina, fere nigrescens, cupuliformis sed tantum 1,5 mm profunda, c. 3,5 mm diam.; lobis exterioribus c. 0,75 mm longis, 2 mm latis, latissime emarginatis; lobis interioribus anguste oblongis, obtusis, antheras subaequantibus arcte incumbentibusque; *pollinia* flava, c. 0,35 mm longa, plus minusve ovoidea aliquanto compressa, margine interiore recto. *Folliculi* fusiformes aliquanto compressi, aliquam divergentes, leviter incurvi, satis laeves.

Typus: ANGOLA, Moçâmedes Distr., Leach & Cannell 14690 (LISC, holo; SRGH).

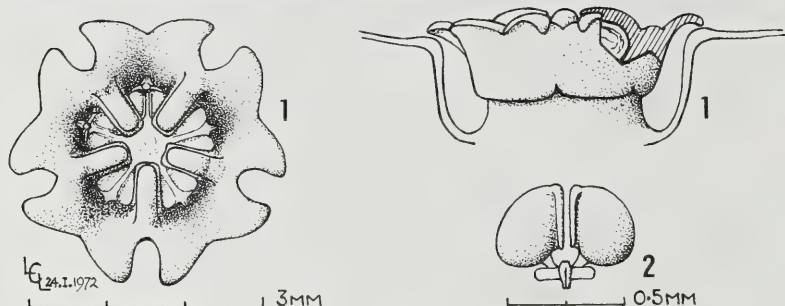


FIG. 1.

ANGOLA. Moçâmedes Distr., ± 21 km N of Chapeu Armado, in association with several euphorbias and other succulents, at foot of rocky ridge, fl. 1.xi.1970, Leach & Cannell 14697 (K; M); ± 20 km on Lucira road, in association with numerous succulents, fl. 1.xi.1970, Leach & Cannell 14692 (BOL; LUAI); ± 10 km on Lucira road, on hillside among red rocks with *Euphorbia carunculifera* Leach, *Cissus* spp. etc., fl. 31.x.1970, Leach & Cannell 14690 (LISC; SRGH); ± 30 km N of Moçâmedes, cult. Johannesburg, fl. Sept. 1971, Horwood, Downes & Chambers sub Lavranos 9745 (PRE); ± 45 km de Moçâmedes para Dois Irmãos, fl. 28.iv.1960, Mendes 3845 (LISC).

This new species from Angola appears to be most closely related to *T. pedicellatum* Schinz but is a larger, more robust, erect plant with spinier, stouter stems, while the flowers with their less deeply lobed corolla and much deeper tube are borne on considerably longer pedicels; the corona is essentially different in that it is so much more deeply cupped with the anthers and the incumbent inner lobes almost or quite included, and the shallowly emarginate outer lobes are quite unlike the deeply bifid lobes of its relative.

It seemed at first that these Angolan plants might represent only a further variation of the extremely variable *T. pedicellatum*, but it is considered that the nature and extent of the distinguishing characteristics displayed by them,

particularly those of the corona, clearly establishes their distinctness at specific level.

T. mossamedense is possibly the most common stapeliad in Angola and although the existing records show its distribution to be restricted to Moçâmedes District it is believed that a plant collected from a rocky hillside near Dombe



FIG. 2.

Trichocaulon mossamedense Leach. Plant collected 30 km N of Moçâmedes by Messrs. Horwood, Downes & Chambers; flowering in Johannesburg. Photo Mr. J. Lavranos.

Grande, in Benguela District, may well represent this species; however, this specimen unfortunately died before flowering.

It is rather surprising therefore that until very recently the species appears to have been collected only once and then not until 1960. One wonders if the more recent gatherings have been due to a periodic population build up, such as has been observed elsewhere among some other species of the tribe; and if so whether this will also be followed by a rapid decline in numbers.

Plant succulent, spiny, erect, up to ± 30 cm high; *stems* 1–4, usually ± 20 cm long, 4–5 cm diam. with 16–20 prominent, tuberculate angles; *tubercles* compressed conical, confluent along the angles, 4–7 mm high, each tipped with a strong, brown spine up to 6 mm long. *Flowers* developed successively from a tubercle apex, usually towards the apex of the stem, the persistent pedicel bases gradually forming a knobby stump-like peduncle, similar to but shorter than that of the geographically associated *Huernia urceolata* Leach. *Bracts* glabrous, narrowly deltate, ± 1 mm long. *Pedicels* glabrous, 10–15(18) mm long (lengthening in fruit) ± 1 mm diam. *Sepals* deltate, acuminate, obtuse beneath, 2.5–3 mm long, ± 1 mm wide at the very slightly overlapping bases, with or without a small subulate fleshy tooth alternating with the sepals inside. *Corolla* rotate (occasionally shallowly campanulate or rarely, somewhat reflexed) $\pm (9)12$ mm (*Mendes* 3845 18 mm) across the apices of alternate lobes, with a tube ± 1.5 mm long, often with a slight annulus around its mouth, pale to dark, almost blackish, maroon, glabrous outside, microscopically papillate and covered within with more or less appressed, very short, mostly acute hairs; *lobes* ovate acuminate, ± 4 mm long, 3.5 mm wide at the base, usually slightly convex. *Corona* glabrous, dark maroon almost black, shallowly cup-shaped, ± 1.5 mm deep, 3.5 mm diam. with the outer lobes spreading, ± 0.75 mm long, 2 mm broad, shallowly broadly emarginate; with the inner lobes narrowly oblong, obtuse, closely incumbent on and subequalling the anthers, with a small hump at the base where adnate to the outer lobes. *Pollinia* $\pm$ compressed ovoid with the inner margin straight, ± 0.35 mm long, yellow attached to the dark brown, shortly winged carrier by short broad caudicles. *Follicles* (not fully developed) somewhat compressed fusiform, divergent, slightly incurved, quite smooth.

Huernia verekeri Stent in Kew Bull. 1933: 145 (1933).—Phillips, Flow. Pl. S. Afr. 15: t.591 (1935).—White & Sloane, Stap. 3: 848 (1937).—Luckhoff, Stap. S. Afr.: 199 (1952).—Jacobsen, Handb. Succ. Pl. 2: 630 (1960) et Sukk. Lexik.: 245 (1970).—Huber, Asclepiadaceae, Prodr. Fl. S.W. Afr. 114: 38 (1967).—Leach in Bothalia 10(1): 48 (1969).

Since the publication of var. *pauciflora* Leach (*Bothalia l.c.*) a third variety has been discovered in Angola. The distribution of this species is therefore now

known to extend from the shores of the Indian Ocean, near the mouth of the Save River in Moçambique, almost to the Atlantic.

Var. **angolensis** Leach, var. nov.

A varietate typica caulibus aliquanto decumbentibus obtuse angulatis, illis varietatis typicae maxime differentibus; corollae tubo fere omnino saturate rubro coroneaque rubella facile distinguenda.

Typus: ANGOLA, Huila Distr., Serra da Chela, *Leach & Cannell 14650* (BM; LISC, holo.; LUAI; PRE; SRGH).



FIG. 3.
Huernia verekeri var. *angolensis* Leach & Cannell 14650

Chromosome number: $2x = 22$. Count by the late Prof. Dr. G. Reese, Botanischen Institut der Universität Kiel (personal comm.).

ANGOLA: Huila District, on the western escarpment of the Serra da Chela, west of Tchivinguiro, cult. Greendale, Rhodesia, fl. Nov. 1971, *Leach & Cannell 14650* (BM; LISC; LUAI; PRE; SRGH).

Plants were found growing in a damp situation on rock ledges of cliffs above Bruco, on the western escarpment of the Serra da Chela. Although not flowering when collected, the appearance of the stems and their habitat convinced us that here was merely another record of *H. volkartii* Werderm. & Peitsch, which was known to occur only a few miles away. Fortunately, in accordance with our usual procedure, a few stems were collected for cultivation and the preparation of herbarium material, if and when flowers should be produced; in the event these obviously, but most surprisingly, belonged in *H. verekeri*.

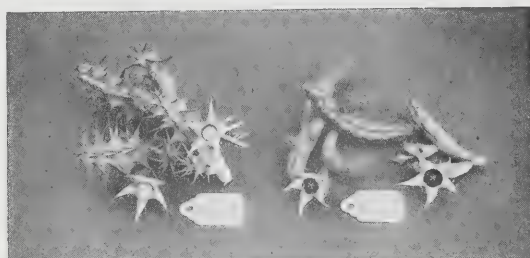


FIG. 4.
Huernia verekeri: a comparison: Left: var. *verekeri*. Right: var. *angolensis*.

Perhaps the most striking feature of the new taxon is the bright red of the corolla tube, with the colour extending almost to its base, which, together with the reddish corona, gives the flowers an appearance so very different from that of those of the typical variety. However, it is in the stems that the really significant difference is found; these, in addition to lacking the strongly toothed angles so typical of var. *verekeri*, adopt a somewhat decumbent habit which is very different from that of the erect caespitose plants of the typical variety.

Varietal rank has been considered appropriate for more or less the same reasons as prompted its use for var. *pauciflora*. As in that variety, only one population has been found, and although this was fairly extensive it is thought that it could easily have arisen from clonal division. Although the divergence in vegetative characters is considerable, this should be viewed against the background of stem variation which occurs in such species as *H. pillansii* N.E. Br. and *H. volkartii* when assessing its relative importance. However, should these characters subsequently be found to be more or less constant throughout its distribution, possibly along the western escarpment of the Serra da Chela, then, considered in conjunction with its quite different ecology, a change in status would most probably be justified.

Huernia andreaeana (Rauh) Leach in *Bothalia* **10**(1):54(1969).

When making this combination the basionym was cited as: "*Duvalia andreaeana* Rauh, l.c. (1961)."

As "l.c." is not strictly in accordance with the requirements of the International Code of Botanical Nomenclature, Article 33 (1966), relating to valid publication, a more explicit reference is given below.

Huernia andreaeana (Rauh) Leach, comb. nov.

Duvalia andreaeana Rauh in *Kakteen u. andere Sukkelenten* **12**:117(1961).

I am much indebted to Mr. J. B. Gillett for drawing my attention to this oversight.

NOTES ON THE GENERIC DISTINCTIONS BETWEEN *DUVALIA* HAW. AND *HUERNIA* R. BR.

Whilst dealing with the foregoing combination it seems opportune to refer to Dr. R. A. Dyer's note in *Bothalia* **10**(2):363–365(1971), in which he suggests that the three new combinations made in *Huernia*: namely, *H. tanganyikensis* (Bruce & Bally) Leach; *H. procumbens* (R. A. Dyer) Leach and *H. andreaeana* (Rauh) Leach, should revert to *Duvalia*. I have again examined the available material and gone over the arguments on which I based these new combinations and find no reason to change my opinion; in fact rather the reverse. However, Dr. Dyer's article appears to me to raise issues of sufficient importance in relation to the generic classification of *Stapelieae* to warrant the detailed discussion which now follows, and for the unavoidable length of which I must apologise to my readers.

In basing his opinion regarding generic placing mainly on the shape and possible evolutionary development of a single character (the dorsal development of the inner coronal lobes) Dyer appears to ignore other characters and their significant *correlations*.

So-called generically "essential" or "exclusive" characters appear so frequently in widely separated species (e.g. "Echidnopsis stems" in *Huernia pillansii* N.E.Br. subsp. *echidnopsioides* Leach) or may be absent in otherwise obviously correctly placed species (e.g. the lack of tube in *H. marnieriana* Lavr.) that one is compelled to rely on correlations of characters rather than on the presence or absence of any one of them.

It is in this connection that Dyer makes great play with "sometimes" in relation to the few exceptions listed in my original article. He states that I have excluded the three controversial species from *Duvalia* because: their coronas are not stipitate; their stem teeth devoid of denticles and their corolla lobes neither replicate nor ciliate (which is correct); but goes on to say that I have allowed other species lacking these characters to remain in *Duvalia* (which

is both incorrect and misleading). Incorrect insofar as the stipitate corona is concerned (Dr. Dyer himself suggests only a possibility of an exception, in *D. maculata* N.E.Br., of which more anon); misleading in the implied correlation of these absences in single species, whereas they were cited only as uncorrelated single exceptions (save for two in *D. sulcata*, and even here the corolla lobes although not replicate are convex) and are restricted to species which are otherwise indubitably *Duvalia*, while absence of cilia (the most frequent exception) may, in some species, be due merely to the loss of these fragile hairs from the available material. However, it should be noted that all four characters are absent from each and every one of the three disputed species and, which is more important, there are no known exceptions whatever for the corresponding positive characters in *Huernia* (the three erstwhile *Duvalia* spp. included).

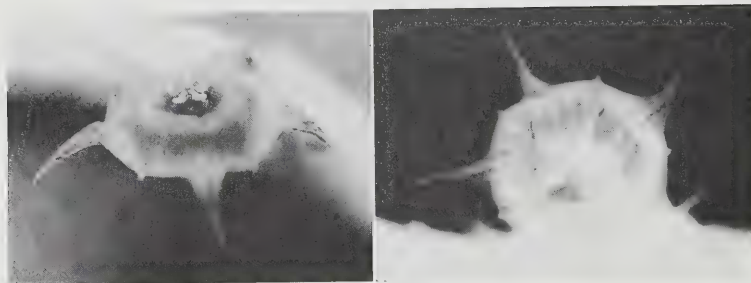


FIG. 5.
Huernia tanganyikensis showing small but distinct intermediate lobes and canaliculate corolla lobes.

Against this correlation of four definite characters Dyer sets as conclusive: the apparent evolutionary development of the dorsal projection of the inner coronal lobes, drawing an arbitrary line between *H. verekeri* and his *D. procumbens*, which not only implies acceptance of "in line" evolution (which I consider doubtful in relation to *Huernia-Duvalia*) but is determined by the degree of enlargement and extent of upturning of this portion of the coronal lobe. He also draws attention to the 5 small teeth alternating with the corolla lobes in *Huernia*, which were omitted by me as being undiagnostic; this seems to me to be a rather nebulous character, "formed by the projecting sinuses" (N.E. Brown), very variably developed in *Huernia* and intermittently present in most genera of the tribe, albeit extremely small when present in *Duvalia*. In stating that none of the disputed species possesses these intermediate teeth Dyer is again in error (see photos) since they are quite evidently present in *H. tanganyikensis*, while the photo (Abb. 2) of *H. andreaeana* in Kakteen und andere Sukkulente 12: 115 (1961) appears to indicate an even greater develop-

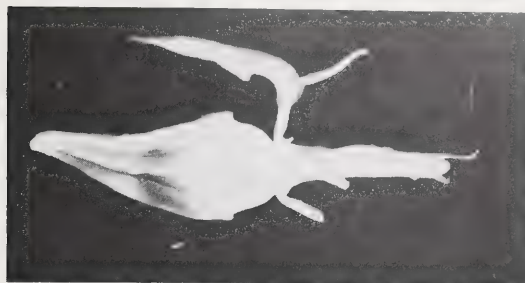


FIG. 6.

Huernia procumbens showing intermediate lobes in bud and above, intermediate lobe concealed by reflexed corolla.

ment of this character in that species. Similar, although very inconspicuous, projecting sinuses are also present in *H. procumbens*; although these are usually concealed by the strongly reflexed corolla they are clearly seen in buds and are, in fact, rather less inconspicuous than those of *H. marnieriana*, which despite its virtual lack of intermediate lobes and almost flat corolla is quite acceptable in *Huernia* on its remaining characters.

Thanks to the efforts of Mr. D. C. H. Plowes I have now been able to examine specimens of *D. maculata* (var. *immaculata* appears to be merely one of the many colour forms) and find that these conform exactly to N. E. Brown's description: "annulus with its sides sloping underneath (not vertical), and the rim rising considerably above the margin of the outer corona", the corona being listed as stipitate in the generic description (see photo.). It seems, therefore, that it is merely the height of the annulus which is exceptional and that the corona is of the stipitate form normal for the genus.

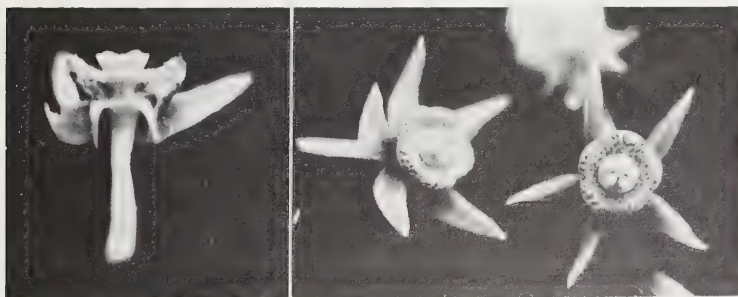


FIG. 7.

Duvalia maculata showing stipitate corona and replicate corolla lobes.

It remains only to examine Dyer's contention that I am in error in saying that my rearrangement requires no amendment to the existing generic circumscription of *Huernia*. In this he is correct only in respect of N. E. Brown's diagnosis of 1909 (for S. African plants), this would need a very slight alteration which could be achieved by the removal of the one word "slight" or the addition of "or enlargement of" in relation to the dorsal ridge of the inner coronal lobes. In fact this amendment has been accepted by implication for many years by the inclusion of such species as *H. schneideriana* Berger (1913) and *H. verekeri* Stent (1933).

What Dyer omits to mention, however, is that the inclusion of "tanganyikensis", "procumbens" and "andreaena" in *Duvalia* requires such a measure of modification to the circumscription of that genus (again taking N. E. Brown's description in Flora Capensis 4) that virtually nothing of significance remains. To be explicit it is necessary to exclude the following:

1. . . . annulus supporting the corona;
2. corona stipitate, resting on the rim or sides of the cup formed by the annulus;
3. corolla lobes replicate;
4. inner corona-lobes $\pm$ pointed at each end;
5. rudimentary leaf with a minute denticle (stipule) on each side at its base; to which could be added: corolla lobes usually ciliate.

Thus leaving only 3 virtually undiagnostic characters as follows:

1. corolla raised into an annulus (common to several genera);
2. outer corona flat, entire, $\pm$ pentagonal or rarely 10-sided;
3. inner corona-lobes turgid, subhorizontal, with the dorsal "point" *usually* somewhat raised and the inner portion not produced into erect points;

which leaves the generic circumscription of *Duvalia* somewhat vague, to say the least, especially as all three characters are to be found in *Huernia*.

In conclusion it appears from the foregoing that it is essential, in the classification of *Stapelieae*, to consider correlations of significant characters, especially in "borderline cases" and that apparent relationships based on single characters or resemblances can often be most misleading.

Any alternative course would seem inevitably to lead either to the recognition of purely arbitrary divisions between the genera or to the merging of several of them, with the attendant, probably numerous, nomenclatural changes. Neither of these, it seems to me, would serve to clarify the position; in fact it seems possible that some clarification might be attainable by slight further division of *Stapelia* and/or *Caralluma*, together with some realignment of a few controversial species. This, however, remains a task for the future, dependent for its solution mainly on the availability of adequate material.

ACKNOWLEDGEMENTS

I wish to express my appreciation and thanks to:—

Mr. I. C. Cannell for his assistance during the expedition when the type specimens of the new taxa were collected.

The Director of the Centro de Botânica da Junta de Investigações do Ultramar, Lisbon (LISC), for the loan of material.

Dr. L. E. Codd, Director, Botanical Research Institute, Pretoria (PRE), for the facilities of the herbarium and for comparative material in liquid of *Trichocaulon pedicellatum* Schinz.

Mr. R. B. Drummond, Chief Botanist, Branch of Botany, Salisbury (SRGH), for assistance in many directions over the years.

Mr. John Lavranos for the photo of *Trichocaulon mossamedense* accompanying this article and for many discussions concerning *Stapeliaceae*.

Mr. D. C. H. Plowes for many specimens of *Stapeliaceae* in liquid including those of *Duvalia maculata*.

The late Professor Dr. G. Reese, for permission to publish the chromosome counts of *Huernia verekeri*.